

Turtle River Times

Visit the refuge at www.loxahatchee.fws.gov



*Celebrating 100 Years
of Conservation*

10216 Lee Road
Boynton Beach, FL 33437-4796
(561) 734-8303 phone or
(561) 732-3684
loxahatchee.fws.gov



**Page 2 - Volunteer Spotlight -
High-tech Exhibits continued
from front page**

**Page 3 - Students' Refuge
photos to be displayed
throughout summer**

**Page 4-5 - What's Happening at
the Refuge and the Calendar of
Events**

Page 6 - People To Nature

Page 7 - Impoundment Report

**Page 8-9 - Dry Season Update -
Meet the Staff**

**Page 10-11 - Get Green!
Go Everglades - Message from
the President of Friends**

Wildlife refuge to go high-tech with exhibits

New state-of-the-art exhibits

\$650,000 worth of interactive exhibits are planned for the Loxahatchee National Wildlife Refuge's new visitor center.

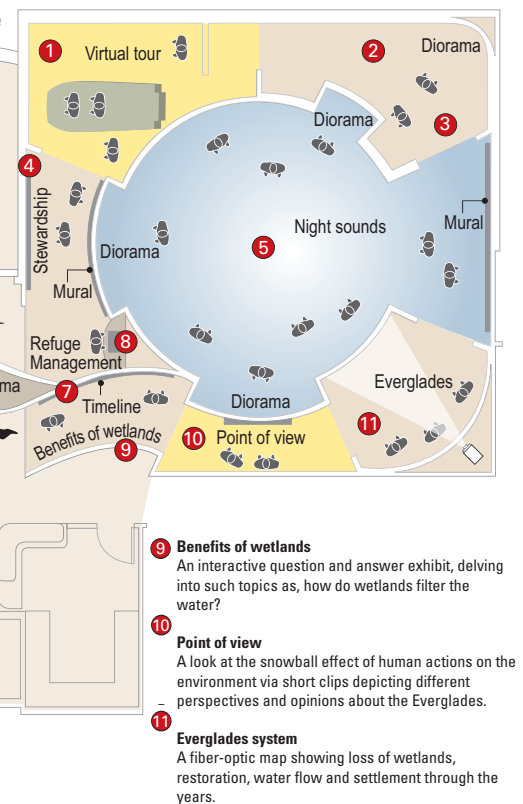
- 1 Virtual tour**
A video airboat journey into the interior of the 143,000-acre refuge via a mini-IMAX experience.
- 2 Why is it different?**
Explains why the northern Everglades and Loxahatchee refuge are different from the rest of the Everglades.
- 3 Habitat diorama**
An exhibit that will help visitors recognize cypress trees, plants and animals of the northern Everglades.
- 4 Stewardship**
Suggestions of how visitors can help the Everglades survive.
- 5 Night sounds**
A mini-theater featuring the sounds of frogs, insects and birds that can be heard at the refuge at night.
- 6 Gator hole**
An exhibit with gator sounds that children and adults can crawl into to experience gator life.
- 7 History and geology timeline**
Explains, with illustrations, tactile 3-D objects, photos and text, the timeline of geologic, historical and archaeological history, highlighting conservationists.
- 8 You manage the refuge**
Visitors will be challenged to manage the refuge, they will then discover the chain of events their decision caused.

Source: Arthur R. Marshall Loxahatchee National Wildlife Refuge

By LINDA HAASE
Palm Beach Post Staff Writer

BOYNTON BEACH — The lights dim slowly as the night sky emerges.

For the next five to eight minutes, the plethora of nocturnal sounds is mesmerizing: a great horned owl's vibrant whoo-hoo-hoo-o, a night heron's harsh squawk, the croak of a bullfrog and



- 9 Benefits of wetlands**
An interactive question and answer exhibit, delving into such topics as, how do wetlands filter the water?
- 10 Point of view**
A look at the snowball effect of human actions on the environment via short clips depicting different perspectives and opinions about the Everglades.
- 11 Everglades system**
A fiber-optic map showing loss of wetlands, restoration, water flow and settlement through the years.

STAFF GRAPHIC

the whippoorwill yelling its name.

Visitors to the Arthur R. Marshall Loxahatchee National Wildlife Refuge will be able to experience "night sounds" of the Everglades in a new planetarium-like exhibit.

It's one of 11 interactive, educational exhibits designed to bring people closer to nature. But first, \$650,000 must be raised for the exhibits, which include a simulated airboat ride, a gator

continued on page 2

Wildlife Exhibits

continued from page 1

hole and a challenge to visitors to manage the refuge.

The refuge's "Friends" volunteer group (www.loxahatcheefriends.com) is taking on its biggest challenge yet with the Get Green! Go Everglades! fund-raising campaign.

And possibly its most important.

"National wildlife refuges are America's promise to its citizens that there will always be places that wildlife and wildlife habitats can thrive," Get Green literature states.

The refuge, on U.S. 441 south of Boynton Beach Boulevard, represents the last vestige of the original northern Everglades, said campaign co-chair and Friends past president Mitch Rosenheim.

And having displays that teach the annual 300,000 visitors to respect and enjoy that fragile ecosystem is essential, say Rosenheim and co-campaign chair Nancy Marshall.

And that makes it vital that the public, especially children, has a venue to experience this, they say.

"We want the refuge to be a memorable and enriching experience for every visitor young and old," Rosenheim wrote in the Friends' Winter 2006 newsletter.

The planned high-tech, interactive exhibits are a good way to capture their attention, Marshall said.

"If our children are educated they will become stewards of the environment... and this is the place to do this," she said. "We have kind of lost touch with nature with the lives we live now. We want to reconnect kids with nature."

Although the new exhibits will have a huge wow factor, they are only a part of what the center has to offer, said Mark Musaus, manager of the 143,000-acre refuge. "We don't want people to just come to the interpretive center and then leave. That is just the starting point, where they will hopefully get excited about going out and exploring the refuge and the Everglades. We want to get their attention, let them know what the Everglades, the refuge is all about. Then they can



Special to Neighborhood Post

The Arthur R. Marshall Loxahatchee National Wildlife Refuge plans to build a new visitors center

go out and hike, bike, canoe or kayak here," he said.

Although the refuge has exhibits, they are at least two decades old — and aren't ones that capture the attention of children, said Marshall. So, when the refuge got \$4 million from the U.S. Fish & Wildlife Service to replace buildings heavily damaged during Hurricane Wilma, it was a chance to update the exhibits that would be in the new 10,000-square-foot building that will include the visitor's center, administrative offices, a multipurpose room and lobby.

"As we speak, the old building is being torn down. This is a historic day. It was 25 years old. We knew we had to do something and in a way, Wilma was a blessing in disguise," said Marshall.

But the demolition and new building will cost \$4 million, Rosenheim said, "and leave no money for the interpretive exhibits which are vital to the presentation of the refuge."

In the past four months, \$155,000 of the total \$650,000 has been raised (cash and pledges of cash) for the exhibits. The campaign will last another 18 months, about the time the building is expected to open.

It will be worth every penny people donate, Marshall and Rosenheim said.

"The entire experience will make people want to go outdoors and hear and see the sights and sounds," said Marshall. "And when they leave here they will see firsthand how important it is for our children to be involved with nature. We're going to leave the planet in their care...now is the time to begin to educate them on the important role they play in the years ahead."

Volunteer Spotlight

"Good Morning Loxahatchee National Wildlife Refuge, May I help you?"



If you hear this greeting after calling the refuge you, you are lucky to have reached Volunteer Frank Bodofsky. Frank has been a volunteer at the Visitor center since May 2005. On any Wednesday and Saturday you will find him answering questions, giving directions and folding brochures. Frank is always willing to cover for another volunteer or help out when there is a shortage.

Before volunteering at the Refuge Frank volunteered for the Florida Department of children and families for 10 years. During this time he took children from the city on fishing classes. He also volunteered for the Boy Scouts of America for 12 Years in New Jersey.

Before moving to Florida, Frank operated a men's shop for 34 years.

Students' Refuge photos to be displayed throughout summer

BY SUSANNA LAURENTI

This summer, Palm Beach County residents can enjoy the beauty of the Arthur R. Marshall Loxahatchee National Wildlife Refuge at a variety of indoor locations.

That's because eye-catching photos of the Refuge will be on display at local venues, including the West Boynton Branch of the Palm Beach County Public Library, at 9451 Jog Road, and the in the lobby of the South Florida Water Management District Headquarters, at 3301 Gun Club Road in West Palm Beach.

But these brilliant images of people, plants and scenery didn't come from a professional's camera. They are the work of students aged 9 to 18 who participated in the Arthur R. Marshall Foundation's Second Annual Student Photography Project earlier this year.

The project, organized by the non-profit Marshall Foundation, aimed to expose urban youth to the Everglades while simultaneously teaching valuable nature photography skills. Most of the 39 children who took part had never visited the Refuge before and had little knowledge of the Everglades ecosystem.

"Our goal was to provide these students with a fun and educational experience in the Everglades in order to help them develop a sense of stewardship over the wetland wilderness in their own backyards," said Marshall Foundation Executive Director Josette Kaufman. Her West Palm Beach-based organization is dedicated to the restoration of the Everglades thorough education and community outreach.

Children were selected from a variety of local schools and child care centers that qualified for "Title I" status, meaning more than half the student population was eligible to receive free or reduced-price lunches. The organizations that participated were The Children's Coalition, a West Palm Beach after-school program that teaches multi-media skills to urban youth, Girls II Women, a mentoring program headquartered at John F. Kennedy Middle School in Rivera Beach, and the Y Girls, a program administered by the YWCA of Palm Beach County.

The students were paired with experienced photographers who provided one-on-one mentoring and taught basic photography skills. Those skills were put to the test on February 3 when stu-

PHOTO CREDIT: Stuart Hoffman



Members of the YWCA's "Y Girls" club use their fingers to practice framing nature photographs at the Refuge. They were among dozens of young people who took part in the Arthur R. Marshall Foundation's recent Student Photography Project.

dents and mentors arrived at the Refuge to photograph people and nature at the Marshall Foundation's Trail Spruce-up. This volunteer clean-up event provided great subject matter for the budding photographers' lenses.

Many of the resulting images were breathtaking, said Cindy Bartosek, a Friends Member who acted as lead mentor for the Photography Project.

"The kids put a tremendous amount of effort into fulfilling the assignments. A lot of their work showed real talent," she said.

The photos spent a month on display at the West Palm Beach Public Library, and are now hanging at the West Boynton Branch of the Palm Beach County Public Library. In mid-June they will go on display at the South Florida Water Management District Headquarters, and the Marshall Foundation is preparing a calendar using the images.

The Student Photography Project, which is funded by a grant from the Palm Beach County Cultural Council, has already been scheduled to take place next year. When it does, ten-year-old Traci Williams, who attends an after-school program at The Children's Coalition, hopes she can once again be a part of it.

"It was fun. I learned how to take close-up photos, and I learned that the Everglades has a lot of reptiles," she said. "I loved seeing the animals at the Wildlife Refuge!"

Contacts and information

Submit articles to:

David Underwood

Call for information:

561-734-8303 or

561-732-3684.

www.loxahatchee.fws.gov

The *Turtle River Times* is published in the winter and summer by David Underwood of the Loxahatchee National Wildlife Refuge with funding support from the Friends of Loxahatchee Refuge.

Comments should be addressed by calling 561-735-6030

Editor:
David Underwood



Bob Cat recently photographed
at the Refuge

Refuge Hours & Fees

The refuge is open to the public from sunrise to sunset daily. Exact times are posted at each entrance and on our website and change with the hours of daylight. Currently the refuge is open at 6:00AM and closes at dusk.

Winter hours for the Visitor Center which begin on October 1 are Monday through Friday, 9:00AM to 4:00PM and Saturday and Sunday from 9:00AM to 4:30PM.

A fee of \$5.00 is charged to private vehicles entering the refuge. When the fee booth is unmanned, visitors are subject to the honor system and should pay at the fee shelter next to the fee booth. Various passes are available. Check at the Visitor Center or Fee Booth for details.

Anyone who would like to get e-mails on upcoming events at the refuge and occasional alerts on ways to help the refuge to send their e-mail address to elinor@dgwilliams.net or david_underwood@fws.gov.

What's happening at the *Refuge*

Regular Activities & Events Descriptions

(see calendar for dates, places, & times)

SPECIAL PROGRAMS

KID'S FISHING DAY – Saturday, June 9, 2006 – 7:30am-12:30pm

As part of National Fishing and Boating Week, children are invited to learn about freshwater fish, how to trap minnows, fishing rules and regulations, and how to catch fish. For children up to 12 years of age, accompanied by an adult. RESERVATIONS REQUIRED (LIMITED TO 25 CHILDREN) CALL SERENA RINKER AT 561-735-6004 TO RESERVE YOUR PLACE.

PUBLIC LANDS DAY – Saturday, September 29 – 8:00am - Noon

The volunteer drive for the 14th annual coast-to-coast effort to clean up public lands is now underway—with this year's focus on the rising tide of invasive species

The largest hands-on volunteer effort to preserve America's lands, the 14th annual National Public Lands Day, will take place at Arthur R. Marshall Loxahatchee National Wildlife Refuge. In addition to the usual facility clean ups and repairs, this year will have a new focus on countering the tide of invasive plants that take over habitats and squeeze out native species. Public Lands Day provides a fun and educational opportunity for Americans to return the favor to those lands and the wildlife they harbor. FOR MORE INFORMATION CALL DAVID UNDERWOOD AT 561-735-6030.

'The Everglades through the Eyes of Children' PHOTOGRAPHY PROJECT AND ANNUAL CYPRESS HARVEST – OCTOBER 27, 2007

Held at the Arthur R. Marshall Loxahatchee National Wildlife Refuge. Sponsored and run by the non-profit Arthur R. Marshall Foundation.

WATERFOWL HUNTING – November- January

The Refuge open waterfowl season is concurrent with the state season of November through January. Hunt days are Wednesday through Sunday, thirty minutes before sunrise to 1:00PM. Closed Christmas day. These regulations are designed to maintain optimum waterfowl population and at the same time provide a rewarding outdoor experience.

2007 Everglades Day BY SERENA RINKER

On February 10, with cooler weather in the morning giving way to bright 75° sunshine, more than 3,500 visitors and over 35 exhibitors participated in our 8th annual Everglades Day Festival. The refuge co-sponsors this event with Audubon Society of the Everglades and the Friends of the Loxahatchee Refuge. "Exploring the Everglades," was this year's theme, allowing the refuge to expand its use of the trails. This year's festival offered walks focusing on many different topics, canoe trips and the ever popular Strazzulla Marsh bus and LILA golf cart tours. Guest speakers, sisters, Maggy Hurchalla, former Martin County Commissioner and Janet Reno, former U.S. Attorney General, (pictured below right) shared their adventures or "expeditions" growing up in the Everglades. Food this year was provided by Sonny's BBQ and Sierra Grille as well as Jensen's Concession and D and D Hot Dogs.



June 07 - November 07



Loxahatchee Activity and Event Schedule

MT = Marsh Trail
HQBR = Headquarters Boat Ramp
VC = Visitor Center

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
SWAMP STROLL 2:00PM (VC)	VISITOR CENTER CLOSED	VISITOR CENTER CLOSED	 CANOE TOURS June 2, 16 & 30 July 14 & 28 September 8 & 22 October 6 & 20			BIRD WALK 7:00AM (MT) Once a month, call for times
SWAMP STROLL 2:00PM (VC)	VISITOR CENTER CLOSED	VISITOR CENTER CLOSED	Meet at 8 am at the boat ramp RESERVATIONS REQUIRED call 561-734-8303 <i>Due to low water levels the canoe trail is subject to closure. Please call for status.</i>			BIRD WALK 7:00AM (MT) Once a month, call for times
SWAMP STROLL 2:00PM (VC)	VISITOR CENTER CLOSED	VISITOR CENTER CLOSED				BIRD WALK 7:00AM (MT) Once a month, call for times
SWAMP STROLL 2:00PM (VC)	VISITOR CENTER CLOSED	VISITOR CENTER CLOSED			*Please call our Visitor Center at 561-734-8303 to confirm dates and times. Program subject to change **Due to the construction of our Visitor Center, at times the boardwalk may be closed. Please call ahead for closings.	
SWAMP STROLL 2:00PM (VC)	VISITOR CENTER CLOSED	VISITOR CENTER CLOSED				BIRD WALK 7:00AM (MT) Once a month, call for times

REGULAR ACTIVITIES

BIRD WALK- - This one-mile walk is for the birds.
Bring binoculars, field guide, and insect repellent.

****November-March, Bird Walks**
Wednesdays and Saturdays @7:30am

NATURE WALK- - Join a naturalist for a discovery tour
of the plants and "critters" that call the refuge home.

SWAMP STROLL- - Enjoy the beauty of a cypress
swamp from a half-mile long boardwalk trail. Learn
about "swamp tea," floating plants, and thigmotropism
as a naturalist reveals the swamp's secrets to visitors.

Events with an asterisk (*) require RESERVATIONS – please call 561-734-8303 and if no answer call 561-732-3684

RESERVATIONS

People To Nature

*"Warming of the climate system is unequivocal."
"Most of the observed increase in globally averaged
temperature since the mid-20th century is very
likely due to the observed increase in
anthropogenic greenhouse gas concentrations."*

-- Intergovernmental Panel on Climate Change.
The smoking gun is the Greenhouse Effect.

Climate Change and Global Warming BY CLYDE BURNETT, PHD

WHAT IS IT?

The sun's continuous spectrum of radiation is characterized by its very high surface temperature. The maximum intensity is in the visible. The similar heat radiation from the earth's warm surface has maximum intensity at longer wavelengths in the infrared. Our greenhouses with glass roofs transmit the incoming visible radiation but absorb the earth's outgoing heat radiation. The heat is trapped in the greenhouse. Actually, we can also control the temperature by opening or closing windows to the outside weather.

The earth does not have that option; the radiation must balance. Now, if we ignore the atmosphere effects, the average earth temperature would be about 360 Fahrenheit cooler than observed, unsuitable for life as we know it. But the atmosphere gases, like water vapor, carbon dioxide, methane and others are strong absorbers of the earth's outgoing infrared, acting in a manner similar to the glass in our local greenhouse. Hence the greenhouse effect.

Now we find that humans have increased the concentration of some of these greenhouse gases. CO₂ has increased by about 1/3 during the industrial era due to burning of fossil fuels. This yields an enhanced greenhouse effect producing a global warming of 0.74° Celsius (about 1.33° Fahrenheit) during the past century.

Now a change from 56° to 57° seems insignificant, but someplace the change is from 32° to 33°; ice and snow melt and the climate has changed. Glaciers are melting, Arctic sea ice is disappearing in the summer, and sea levels have risen about 7 inches during the past 40 years.

CAN WE IGNORE IT?

Atmospheric models using fast computers have reproduced the recent temperature changes and predict future increases of about 0.2° C (about 0.36° F) every ten years for the near future, based on projections of continuing CO₂ increases. Well, a degree or so increase in Florida afternoon temperature won't be a problem; just turn up the A/C another notch. And the farmers will be happy to have fewer freeze days. And the veggies and oranges should grow a bit faster with the extra CO₂. Snowbirds will continue to

visit; northern winters might get even nastier. And who will notice a few millimeters sea level rise every year. Ah, we can respond to that knock on the door with more tax money to replace the sand from offshore. Of course, if in the hazy future our well water from the Biscayne aquifer tastes a bit salty, that will be the message that the intruder is already in the house, and he plans to stay for a very long time. No problem, we just build a few more desalinization plants. But we hear about uncertainties in the future behavior of the Greenland ice cap; there is a 20 ft rise in seal level stored in that ice. Our grandchildren might have a very unpleasant surprise sometime in the distant future.

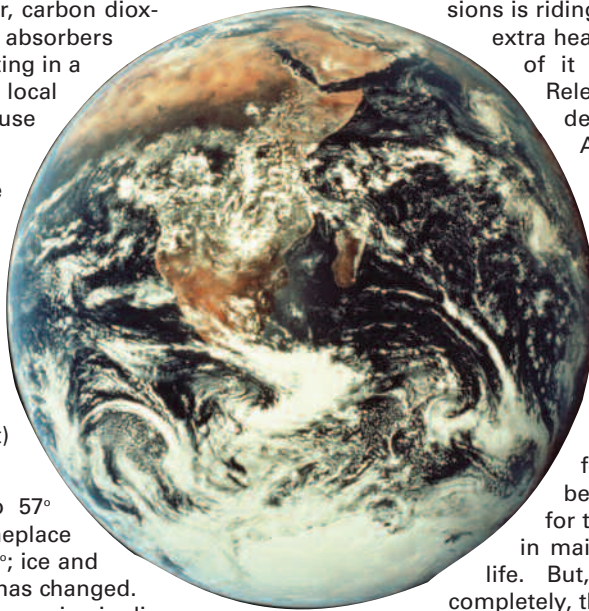
Now these fall hurricanes are a real nuisance; but FEMA can always send money to fix things. Just natural variations like the El Nino.

But that enhanced greenhouse effect of increasing CO₂ emissions is riding on top. Our planet has to transport that extra heat from the tropics to high latitudes, much of it as stored energy in the water vapor. Release it suddenly and the wind blows. Nice deep warm layers of sea water in the Atlantic and the Gulf tend to make Cat-5 hurricanes. We're talking about real weather folks.

Some of these consequences of business as usual with increasing CO₂ are scary. A thoughtful person might wonder if "it's time to wake up".

CAN WE FIX IT?

It won't be easy. The CO₂ that we add to the atmosphere today will not disappear for a century or so. Now some of us believe we have a moral imperative to care for the health of our planet, and there is logic in maintaining a climate suitable for our good life. But, even if we could cease CO₂ emissions completely, the earth's average temperature would not decrease for a very long time. And we can only make matters worse. But there are ways to decrease CO₂ emissions. We can increase the efficiency of our automobile consumption of gasoline. We can improve energy efficiency in our buildings. (Project 18 Seconds--the time to change that light bulb--is one example.) Generation of electric power from nuclear fission/fusion produces no CO₂. Use of a small fraction of the sun's radiation for solar panels and wind turbines yields no CO₂. Cheap electric power from coal-burning plants could continue—but only if the CO₂ is captured and stored in the ground or sea bed. Carbon neutral energy from biofuels for electric power or transport is attractive, but there are debatable side effects. Some combination of all of the above will be desirable to accomplish the slowing of CO₂ emissions in the critical time scale of about a decade. But if we procrastinate in slowing the CO₂ increase, we may have generated extremely difficult and costly problems for our children and grandchildren.



BY SANDIE SIMON

Throughout the fall avifauna richness and abundance were relatively high in C-7, partially due to the influx of migratory species arriving. At times wading bird species were observed in assemblages of several hundred throughout the impoundment including great egrets, white ibis, glossy ibis, great blue herons, little blue herons, tricolored herons, cattle egrets, black-crowned night-herons, and snowy egrets. Pied-billed grebes and their broods were seen utilizing the compartment during this time. Northern harriers and snail kites could be seen roosting in the willow or foraging over the impoundment. Additionally, black-bellied whistling-ducks were seen foraging and resting throughout the compartment. By October, American coot could be seen in large numbers throughout the impoundment. Bird use increased in C-7 following the cookie cutter treatment in November. Wood storks were observed foraging in open water pockets within the impoundment. Also, common snipe and killdeer were seen foraging on the exposed mudflats throughout C-7. High water levels and sparse vegetation in C-7 during early winter provided excellent foraging opportunities for waterfowl including blue-winged teal, wood ducks, mottled ducks, ring-necked ducks, and even hooded mergansers. Various songbird species were common throughout the impoundment in winter including palm warblers, yellow-rumped warblers, and northern parulas, to name a few. Merlins were also seen periodically during winter foraging over, or roosting in, C-7. On one winter survey a brown pelican was observed roosting in the willow within C-7. By February, vegetation throughout the impoundment was getting dense, providing more favorable habitat for most marshbirds. American bitterns were seen utilizing the compartment at this time. Also, mottled ducks began nesting activities on mudflats within concealed vegetation during late winter. In early spring, various avifauna could be seen conducting courtship displays and nesting activities throughout C-7. Water levels were lower at this time, exposing mudflats for foraging and nesting sites. During one spring survey a double-crested cormorant was seen roosting in the willow of C-7.

In early fall vegetation in C-8 was relatively dense, yet open pockets of water remained throughout the impoundment. These pockets provided foraging opportunities for many wading bird species. Spotted sandpipers were routinely observed foraging on mudflats during this time. Snail kites were seen roosting in the willow or cypress trees as well as foraging over the impoundment. Various songbirds could be seen utilizing the sub-canopy vegetation including northern waterthrush, Philadelphia vireo, common yellowthroats, eastern phoebe, eastern kingbirds, white-eyed vireo, and even a pine siskin. By December, vegetation had become dense within C-8 and marshbird calls became abundant, particularly king rails and Virginia rails. During one winter survey of C-8 a sora was heard calling from the vegetation. Great blue herons began nesting activities in late December in the northeast cypress stand of C-8. Various bird species were observed in courtship displays and vocalizations throughout this time period. During February, water levels were lower exposing mudflats and creating water pockets within the impoundment. Waterfowl could be seen dabbling within these pockets including blue-winged teal, wood ducks, and green-winged teal. Greater yellowlegs, spotted sandpipers, and an individual willet were observed foraging on mudflats during one survey in C-8. Additionally, four roseate spoonbills were seen foraging within the impoundment during late winter, and were routinely seen foraging in this area until early spring. By late spring, five great blue heron nests were observed in the cypress stand in C-8. During early spring, red-shouldered hawks were nesting in the southeast cypress of C-8. Red-shouldered hawk nestlings could be seen during March. Also, great blue heron nestlings were observed in the northeast cypress stand of C-8 by early March. There were six active great

blue heron nests at this time, and nest building activity still continued. By April there were eight active great blue heron nests containing fledglings or nestlings throughout the cypress stand of C-8.

In September, vegetation was relatively dense and tall throughout C-9, thereby hindering opportunities for viewing wading birds. However, various songbirds and marsh-birds could be seen or heard throughout the impoundment. Snail kites were observed roosting in cypress trees, and northern harriers could be seen foraging over the impoundment during fall. Osprey were regularly seen fishing in the canals surrounding the impoundment. Killdeer foraged on the few exposed mudflats along the interior of the impoundment during this time. On one survey in late November, a merlin was observed roosting in a cypress tree. Bird use throughout the impoundment remained relatively low for the duration of fall. By early winter, water levels were lower in C-9 and a large assemblage of wading bird species, approximately 500 individuals, were observed foraging within the impoundment. These species include great blue herons, great egrets, white ibis, little blue herons, glossy ibis, tricolored herons, snowy egrets, and cattle egrets. Blue-winged teal and wood storks were commonly seen foraging in the few remaining pockets of water throughout winter. Throughout late winter and early spring, bird richness and abundance seemed to decrease in C-9. However, occasional surveys still provided wading bird use in large assemblages, particularly great egrets, glossy ibis, and white ibis. Great egrets were observed in courtship displays at various times throughout the season.

Vegetation was dense and tall throughout C-10 during fall. Avifauna abundance and richness was low during this time. Common moorhens and American coot were the predominant species observed. On one September survey, an American bittern was observed in the vegetation. Yellow-headed blackbirds could be seen perched on vegetation within the impoundment during early winter. By late December, vegetation in C-10 had been cut down, almost completely opening the impoundment. After this event over 100 wading birds were seen foraging throughout the impoundment including white ibis, great blue herons, cattle egrets, snowy egrets, glossy ibis, and great egrets. Waterfowl such as blue-winged teal, mottled ducks, wood ducks, and ring-necked ducks were also seen foraging within the compartment. By January, water levels were lower exposing mudflats where common snipe, spotted sandpipers, and dozens of killdeer were routinely seen foraging. Bird use in C-10 remained relatively high throughout winter. On one winter survey approximately 400 glossy ibis were observed foraging within the impoundment. During late February, mallard ducks in eclipse plumage were observed foraging throughout C-10. By early March, there was no standing water remaining in the compartment interior. A sandhill crane was observed foraging on the mudflats in C-10 during one spring survey. Also during this time, immature black-crowned night-herons were seen foraging along the eastern edge of the compartment. By April, bird use dropped off throughout the impoundment.



2007 DRY SEASON UPDATE

This dry season, the entire Lower East Coast Service Area, which includes the greater Everglades and metropolitan south Florida is currently experiencing severe drought conditions. South Florida has not experienced a prolonged drought of this magnitude since 1989-1990. As the 2007 dry season progresses, it is looking more and more likely that this drought may be more severe than some of the driest events we have experienced on record.

Many factors have contributed to drought conditions, but mostly it is a function of a lack of rainfall over a long period of time. Add that condition to already low water levels in Lake Okeechobee and the combination makes for a very difficult management situation, one where water for normal Refuge operations is unavailable.

Single dry season events can be beneficial to wading birds and habitats. The Everglades system relies on its dry season and periodic (every ten years or so) severe dry season events to help promote the long term health and prosperity of the marsh. We have seen that wading bird responses can be very good the year following a drought as was the case after the 2000/2001 hydrologic year (May to May). The major concern for natural land managers in south Florida are prolonged and chronic dry events, which can be extremely detrimental to marsh recovery and wading bird use, and can exacerbate extreme fire behavior. The periodicity of drought conditions can be eased if we all contribute and share the adversity of drought years by doing our best to conserve water throughout the year.

2007 DRY SEASON CONDITIONS

Rainfall:

While rainfall in southern Miami-Dade County was slightly below average for the 2006 calendar year, further north in the Lake Okeechobee / Everglades Basin, rainfall was significantly below average, which has reduced water supply for downstream users in 2007. Table 1 provides Jan/Feb/Mar 2007 mean rainfall amounts for the Refuge in inches as compared with historic averages and deviation from the mean. For the three month reporting period, the Refuge has received 37% less rain and is 4.45 inches below the 43 year historic mean in 2007.

Month	Historic Mean*	2007 Totals	Deviation from Historic Mean	Percent Deviation from Historic Mean
January	1.97	0.48	-1.49	75
February	2.27	1.58	-0.69	30
March	2.82	0.55	-2.27	80
Total	7.06	2.61	-4.45	37

Mean rainfall (inches) for the Refuge from January-March as compared with 2007 rainfall and deviations from historic mean.
*from 1963-2006



Refuge biologist Miller scans the marsh near the canoe trail. Typically, this setting is covered with water but current dry conditions have greatly reduced surface water levels.

Marsh Water Levels:

Currently, water levels at the Refuge are significantly below average for this time of year and because there is little water available from upstream sources, we expect and have already seen interior marsh water levels drop to the 15 foot elevation in the marsh interior. The 15 foot elevation is an important level in that at this water elevation, much of the Refuge lacks surface water. Ground water can still be found but with the passing of time and continued dry conditions, water loss is experienced below the marsh surface, which reduces wading bird forage options and increases the risk and potential for severe and damaging fire.

ECOLOGICAL SIGNIFICANCE:

Muck Fire and Damaging Dry Season Fire Potential:

Muck fires or extreme dry season fire can be extremely detrimental to the marsh. Muck loss is of greatest concern as it takes many years to generate a few centimeters of muck but one fire can greatly reduce muck levels. Once muck is lost, marsh elevations are reduced, which promotes deeper and more frequent water cover that can have profound effects to our habitat types including tree islands and sawgrass communities. The potential for extreme dry season fire is highest when extended drought conditions and low humidity levels are experienced. Recent field data collected from the Refuge interior suggests that soil moisture levels do not currently support an increased risk of muck fire; however, as the drought year continues, soil moisture may decrease thereby increasing muck fire risk. According to fire models used to identify the severity of drought relative to soil moisture in the top 8 inches of the soil profile, the Refuge is approaching high levels of drought condition for this time of year.

Wading Bird Response:

Spring is the time when impacts of the dry season are greatest and this time happens to coincide with our wading bird nesting season. For eons, wading birds have taken advantage of spring dry seasons as seasonal marsh dry-downs provide easy opportunities to find prey and feed young chicks. Expending the least amount of energy to prey on aquatic organisms is essential to a successful nesting season. Nesting birds fly from the roost to forage ponds and sloughs and generally move from the north Refuge during the beginning of the dry season to south where water levels are higher. This drying front is an important phenomenon to manage. Too little



Graphing water elevations recorded at US Geological Survey (USGS) gage stations in the Refuge interior helps us understand how this season's dry conditions compare to historic dry seasons. The black line indicates average marsh elevations during our last severe drought year of 1989. Present day average marsh elevations are indicated by the red line, while blue represents the 2001 dry season. The historical average is in yellow. According to this chart, we have higher gage heights this year than we had during our last severe dry period of 1989. We attribute this to a 1995 change in our regulation schedule which pulled our "floor" or the level at which further water releases are not permitted up from 11 feet to 14 feet and pushed the "ceiling" or the level at which water is released for flood control purposes up from 17 feet to 17.5 feet. The change has resulted in higher water levels over the year as compared to past regulation schedules. We are currently about 0.5 feet below the historic average for this time of year.

water means less prey opportunity not only for this year but potentially for coming years. Too much means wading birds have a difficult time finding prey easily for hungry chicks.

The status of aquatic organisms then is a very good indicator of marsh response to severe dry conditions. In most Everglades habitats, fish and invertebrates seek refuge in topographic lows in the landscape. Small groups of aquatic organisms are then available to disperse and repopulate flooded wetlands during the rainy season. Currently, many of the topographic lows have water but the linkages to the holes - sloughs and wet prairies - are drying down. Few areas are likely to be inundated and available as dry season refugia as the dry season persists. Therefore, once the wet season begins, the Refuge will be starting with a lower standing stock of aquatic organisms to repopulate the flooded wetlands. This could result in reduced prey availability for water-dependent birds, e.g. wading birds, snail kites, waterfowl.



View from the canoe trail. The canoe trail water levels are about 0.6 feet from the top of the marsh. This is a fairly common scene in the interior this dry season. Unfortunately, the canoe trail needed to be closed due to the low water conditions.

Meet The Staff

Deputy Project Leader
ROLF OLSON

Public Use Team Leader
DAVID UNDERWOOD

Administration
KIM ARSERIO
JEAN RYAN

Everglades Program Team
NICK AUMEN
MATT HARWELL
LESLIE MACGREGOR
DONATTO SURRETT
JIM ENTRY
REBEKAH GIBBLE

USFWS Ecological Services
CINDY FURY

Law Enforcement
WILLIAM CALVERT
CURTIS STONE

Wildlife and Habitat Management
MARK BARRETT
GAYLE MARTIN
ANGIE MARKOVICH
BILL MILLER
GEORGE PELT
TIFFANY TRENT
JOHN WALLACE
GRANT GIFFORD

Maintenance Operations
MANUEL GARCIA
JERRY GRIST
ALLAN HANSEN
STEVE MATZKOW

Environmental Education & Interpretation
SERENA RINKER

Fee Staff
KEITH BOLIEK
LEW HECKER

LILA On-site Manager
ERIC CLINE (SFWMD)
HARVEY HILL

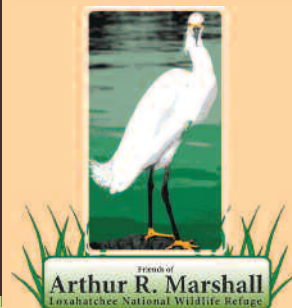
Get Green!

GO EVERGLADES CAMPAIGN

Friends of Arthur R. Marshall Go Everglades Campaign Loxahatchee National Wildlife Refuge

Please join us in this effort.
Protecting the environment
is a sound investment.

www.loxahatcheeffriends.com



Seminole celebration during Everglades Day



Scouts pick seeds during annual Cypress Harvest



Volunteers collect seeds during annual Cypress Harvest



Children enjoy a day on the Refuge's 5.5 mile canoe trail

President's Message

After 16 years of service to the refuge as a volunteer, roving interpreter, swamp stroller, and member of the Friends of ARM Loxahatchee Wildlife Refuge, I was elected to lead the Friends group as their President. This is a humbling task as I find myself in the company of many dedicated professionals. I rely on the ability of so many to complete the work that must be done.

Never before have we faced so many challenges for the future. After Hurricane Wilma, we saw the destruction of the Administration building and the Visitors Center. The rebuilding program will take two years to complete. The new Visitors Center will be special. There was no money put into the exhibits display in the buildings interior. The Friends have organized an exhibit funding drive to raise the necessary money to build a beautiful interactive exhibit.

The Everglades Agricultural Area (EAA) Land which surrounds the Refuge is being attacked by many development projects which plan to use this land for other purposes. They include building a chemical warehouse at our entrance. FP&L has two power plants on their drawing board (one coal fired). Dump sites are being planned to boarder the western edge of the Refuge. A 2,800 home development is planned on our southern edge. The environmental community has risen to these challenges and continues to seek political support for our position.

My message is to you as the public who use and enjoy land that has not succumbed to the building frenzy which is south Florida. Over 300,000 visitors come to the Refuge each year. It is a primary site for scientific research forming the foundation of the multi-billion dollar comprehensive Everglades Restoration Project.

How can you help? Two ways to take part - One is to join the friends organization which will keep you aware of all that takes place in and outside the Refuge. Two is to become more proactive in our concerns, and if able support our drive for the funding of the Exhibits in our new Visitors Center.

Sincerely,
JAY BRENNER
Friends President

Friends Board of Director

Jay Brenner,
President

Ruth Levow,
Vice President

Jean Poleshuck,
Treasurer

Ruth Levow,
Government Chair

Tom Poulson,
Education Chair

Rebecca Garvoille
Susanna Laurenti

John Arthur
Marshall

Julie Muolo

Lester Nelinson

Cynthia Plockelman

Elinor Williams

MISSION OF THE FRIENDS

The friends of Loxahatchee Wildlife Refuge is committed to promoting better understanding and appreciation of the natural history and natural environment of South Florida, the overall Everglade system and, in particular, the Arthur R. Marshall Loxahatchee National Wildlife Refuge.



The Friends of the Arthur R. Marshall Loxahatchee National Wildlife Refuge is a not-for-profit 501 (c) (3) organization and all contributions are tax deductible to the extent provided by federal and state law. A copy of the official registration and financial information may be obtained from the Florida Division of Consumer Services by calling 1-800-435-7352 within the State of Florida. Registration does not imply endorsement or recommendation by the State of Florida.

YOU'RE INVITED TO BECOME a Friend

ARTHUR R. MARSHALL LOXAHATCHEE NATIONAL WILDLIFE REFUGE

AS FRIENDS

We support, preserve and enhance the Arthur R. Marshall Loxahatchee National Wildlife Refuge and its use for recreational, educational and scientific research purposes.

AS FRIENDS

- ✱ We promote conservation and understanding of the Everglades
- ✱ We support Refuge activities
- ✱ We generate funds and foster volunteer involvement at the Refuge
- ✱ Your support will help us to preserve the only National Wildlife Refuge in the Northern Everglades and help us to serve audiences of all ages, particularly the children who will care for the future of our Refuge

AS FRIENDS

- ✱ You will be invited to a wide-range of 'Members Only' activities
- ✱ You will Receive a subscription to 'Turtle River Times' the official publication of the Refuge
- ✱ You will receive a 10% discount every time you shop at our bookstore/gift shop
- ✱ And most of all...You will be supporting our national treasure...The Everglades!

The Arthur R. Marshall Loxahatchee National Wildlife Refuge is named after Conservationist of the Decade and Everglades Advocate, Art Marshall (1918-1985).

Art was a leading figure in virtually every public issue that had to do with preserving the natural systems of Florida for over 30 years....especially the Northern Everglades...our Refuge.

The refuge consists of 143,874 acres, protecting the last remaining portion of the unique northern Everglades.

The refuge offers wintering habitat for migratory waterfowl and nesting foraging habitat for wading and shorebirds. The refuge offers fishing, boating and bird watching. A Visitor Center with bookstore, an observatory tower, a fishing pier and nature trails offer visitors numerous opportunities to enjoy the Everglades. The Refuge is open for your enjoyment daily from dawn until dusk.

The Refuge is located in Boynton Beach Florida on US 441/SR8, two miles south of junction of SR 804/Boynton Beach Blvd or 3 miles north of junction SR806/Atlantic Avenue.

ARTHUR R. MARSHALL LOXAHATCHEE
NATIONAL WILDLIFE REFUGE
10216 Lee Road, Boynton Beach, FL 33437-4796

Visit our website www.LoxahatcheeFriends.com

For further information about the Friends of the Refuge please call (561) 734-8303 or (561) 732-3684

✱ BECOME A FRIEND TODAY – It's as easy as One...Two...Three ✱ MEMBERSHIP APPLICATION ✱

STEP ONE: Select the Annual Membership that best suits you

- | | | |
|--|--|--|
| <input type="checkbox"/> \$5.00 Student Membership
(Under 18 years) | <input type="checkbox"/> \$25.00 Family Membership | <input type="checkbox"/> Contribution \$ _____ |
| <input type="checkbox"/> \$15.00 Individual Membership | <input type="checkbox"/> Organization \$100 | To be used for programs that
support and enhance the refuge |

STEP TWO: Complete the following:

I would like to pay by ___ Check ___ Credit Card **Make checks payable to:** Friends of the Loxahatchee Refuge

Credit Card Information: Card Type: ___ Visa ___ MasterCard ___ Discover

Name on card _____

Card Number _____ Expiration Date _____

Billing Address _____ Company _____

City/State/Zip Code _____

Telephone _____ Email _____

- ☐ Please send me information about volunteering at the Refuge

STEP THREE: Mail Today

Friends of the Arthur R. Marshall Loxahatchee National Wildlife Refuge
P.O. Box 6777, Delray Beach, FL 33482

*“ There are no other
Everglades in the world”*

MARJORY STONEMAN DOUGLAS



United States Department of the Interior
Fish and Wildlife Service
A.R.M. Loxahatchee National Wildlife Refuge
10216 Lee Rd.
Boynton Beach, FL 33437-4796

Non-Profit Org.
U.S. Postage
PAID
Boca Raton, FL
Permit No. 2078

THIS SUMMER

Get up. Get reading. Get outdoors.

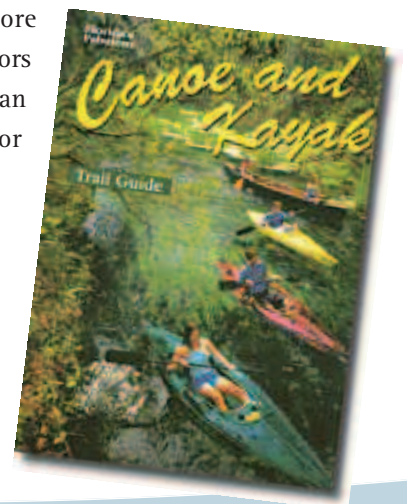
Books that bring the World to You
and You to the World.



Wherever you live—in the city, suburbs, or rural areas—nature is just outside your door. You and your friends can learn about and connect with nature right in your own neighborhood. Our bookstore carries the latest best-selling books, reference publications, handbooks and field guides, books for children, clothing, accessories and gifts.

Visit our bookstore located in the Visitors Center where you can find something for everyone.

FLORIDA'S FABULOUS
CANOE AND KAYAK
TRAIL GUIDE,
2004 world publications



EVERGLADES TRAIL STORIES OF THE EVERGLADES,
narrated by Charles Osgood and introduced by U. S. Senator
Bob Graham with music by Jimmy Buffett. A 2-disk set